

similar chain of superorbitals in *Psophia crepitans*, "only in an enfeebled form," is mentioned. The same author, in a memoir "On the Structure and Development of the Skull in the Ostrich Tribe," read before the Royal Society on March 9th, 1865, records the occurrence of a double row of these bones extending all along the superorbital margin from the lacrymal to the postfrontal process in *Tinamus variegatus*.

I have now to announce the occurrence of a similar chain of ossicles in four out of the eight recognized species of *Arboricola*, a genus of Indian partridges, viz. in *A. torqueola*, *atroregularis*, *rufogularis*, and *intermedia*; and I look forward with especial interest to the examination of skulls of the two of the remaining species which have been referred by some authors to the subgenus *Peloperdix*, and which inhabit the Tenasserim provinces and the Malay peninsula.

Mr Parker has pointed out how in the lapwing (*Vanellus*) the frontal in the young bird sends out square denticles of bony substance under and beyond the nasal gland, which coalesce with one another, with the lacrymal in front, and with the postfrontal process behind, so as to form beyond the gland a secondary frontal margin, which acts as a smooth cave to the eyeball—and that the superorbital chain of bones in the tinamou takes the place of this secondary frontal margin and the denticles in the lapwing, the same end being attained by different means. But in the *Arboricolæ* the arrangement is totally different: in them the margins of the combined frontals, so far from being bevelled or scooped for the reception of the nasal gland, are rather prominent, and the internal edges of the ossicles composing the chain come into close relation of apposition with them.

I have examined a considerable number of species of Gallinaceous birds, small and great, including, by the kindness of my friend Major Godwin-Austen, a species of *Bambusicola*, but have hitherto failed to detect so much as a single grain of bone in the superorbital membrane of any one of them.

The *Arboricolæ*, I may add in conclusion, differ from all in not having the temporal fossa bridged by bone, the zygomatic process of the squamosal being quite rudimentary.—*Journal of the Asiatic Society of Bengal*, vol. xliii. part 2, 1874.

On the Helminthological Fauna of the Coasts of Brittany.

By M. A. VILLOT.

The shores of Roscoff, so rich in the lower animals, offer to shore-birds an easily attainable lodging and food as abundant as it is varied. These are, in fact, very numerous there, and certainly play an important part in the economy of the fauna. The species most commonly met with are the following—*Tringa canutus*, *T. alpina*, *Charadrius hiaticula*, *Pluvialis apricarius*, *Calidris arenaria*, *Streptopelia interpres*, *Totanus calidris*, *Limosa rufa*, *Numenius arquata*, *N. phæopus*, *Hematopus ostralegus*, *Ardea cinerea*, *Larus ridibundus*, *Carbo cormoranus*, *Sterna paradisea*, *S. hirundo*, *S. minuta*, *S. fissipes*, *Uria troile*, and *Fratercula arctica*. The greater number of these

birds, especially the smaller ones, harbour a multitude of Helmintha, which are easy to procure, and which I have been able to examine while alive. Their study, from the point of view of habitat, has already furnished me with a great mass of facts which fully confirm the general considerations of my preceding note.

I will first cite three species of Nematoids :—*Ascaris spiculigera*, Rudolphi; *Ascaris heteroura*, Creplin; and *Spiroptera aculeata*, Creplin. *Ascaris spiculigera* was found by Creplin in the digestive tube of the guillemot (*Uria troile*); and it is there also that I have myself met with it at Roscoff; but it has been noticed in many other sea-birds (divers, grebes, mergansers, auks, sea-gulls, pelicans, cormorants). The *Ascaris heteroura* is not uncommon in the intestine of the golden plover. As for *Spiroptera aculeata*, it is found abundantly in the proventriculus of the variable sandpiper.

The *Echinorhynchi* are very irregular in their habitat, but they are also unfortunately very difficult to characterize. The sanderling (*Calidris arenaria*) and the common turnstone (*Strepsilas interpres*), in which no species of Acanthocephala were previously known, have furnished me with two probably new species. That of the sanderling has an oval body, very much swollen and regularly folded across; that of the turnstone is distinguished, on the contrary, by a very long linear body armed with prickles on its anterior parts, and by a very short trunk. A species allied to the latter, but still more elongated, inhabits the intestine of the laughing-gull; it is perhaps *Echinorhynchus linearis*, Westrumb. I have often obtained *Echinorhynchus inflatus*, Creplin, in the ringed plover, and in the variable sandpiper *Echinorhynchus polymorphus*, Bremser, which is very common in ducks. On the other hand, *Echinorhynchus striatus*, Goeze, which usually lives in the intestines of waders, and particularly in those of the heron, is found at Roscoff in a totipalm Palmipede, the common cormorant. This *Echinorhynchus*, of which we possess as yet only two bad specimens, is distinguished from all its congeners by its strange forms and its mode of fixure. The anterior part of its body, which is very much inflated and covered with prickles, becomes, when the trunk is retracted, a true sucking-disk, by the aid of which it fixes itself to the walls of the intestine. In this state it resembles certain spinous *Distomata*, such as the *Distoma ferox*, Zeder, which likewise inhabits the intestine of the herons, and with which one might at first sight confound it.

The Cestoids are also numerous, and not less interesting. The species belonging to the genus *Tænia* may be divided into two groups, plainly distinguished by the relative size of the hooks with which their trunk is armed. *Tænia crassirostris*, Krabbe, and *Tænia filum*, Goeze, have the hooks very short, and are therefore easy to distinguish. The first is found in the ringed plover, the second in the variable sandpiper. The species with large hooks are less distinct and less easy to recognize. *Tænia retirostris*, Krabbe, lives in the intestine of the common turnstone; *Tænia nymphaea*, Schrank, a form very nearly allied to the preceding, is peculiar to the curlew; the *Tænia ericetorum*, Krabbe, is only found in the golden plover; *Tænia*

inversa, Rudolphi, may almost be said to line the intestine of *Sterna fassipes*. A very common species, which is perhaps *Tænia lævigata*, Rudolphi, but which may perhaps be new, develops itself indifferently in the curlew, the sanderling, the common turnstone, the variable sandpiper, and the knot. The genus *Ophryocotyle*, established by Friis in 1869, is represented at Roscoff by two species. *Ophryocotyle proteus*, Friis, is found in the variable sandpiper and the sanderling as well as in the ringed plover; the other species is new, and lives in the godwit.

The parasites of the Cetacea of the suborder Cetodontes have been lately carefully collected; but it is probable that we are still far from knowing all. In a common dolphin, dissected in the laboratory of Roscoff on June 22nd, 1874, we found at the base of the pectoral fins, between the fat and the muscles, a singular worm, which I have been unable to determine, and of which I will shortly give a description. This curious parasite seemed to me to resemble the *Pseudalii*; but it certainly differs from all the species of this genus at present known. The same dolphin contained in its stomach a prodigious quantity of *Ascaris simplex*, Rudolphi, in all stages of development.

I may also notice as being found at Roscoff two unpublished *Cercariæ*, the *Rediæ* of which live in marine Mollusca. One of them, discovered by Professor de Lacaze-Duthiers, is a parasite of *Calyptrea sinensis*, and is distinguished by its tail, which is furnished with two membranous lateral expansions, regularly plaited across. The other, which much resembles two *Cercariæ* described by Müller (*C. setifera* and *C. elegans*), is a parasite on *Nassa reticulata*.

We have still to study the migrations and metamorphoses of all these species. The subject is without doubt very attractive; but it requires much method and circumspection and a long series of observations. It will be this year the principal object of my researches. Some experiments I have made in this direction on the parasites of the birds have not been unfruitful, and I hope soon to be able to communicate to the Academy the results obtained.—*Comptes Rendus*, April 26, 1875, p. 1098.

On the Action of Borax in Fermentation and Putrefaction.

By M. J.-B. SCHNETZLER.

In the scientific discussion which took place before the Academy between MM. Pasteur and Frey on the theory of fermentation M. Dumas intervened, stating that there are two sorts of ferments:—those of which beer-yeast is the type, which live and multiply during the fermentation; and those represented by diastase, which, on the contrary, are destroyed during their action*.

Restricting the name to the chemical action produced by ferments

* *Revue des Cours scientifiques*, 1872.